

REMARKS

The Examiner's indication that claims 3, 4, 8 and 11-17 would be allowable in view of the prior art has been noted with appreciation. For the reasons which follow, it is respectfully submitted that all claims are allowable.

Claims 1, 2, 5-7, 9, 10 and 18-20 were rejected under 35 U.S.C. 103 over Narahara. This rejection is respectfully traversed.

Considered very broadly, the method of the present invention involves applying and drying a photosensitive glass paste containing glass in a photosensitive vehicle, forming via holes and baking the paste to form glass containing layers and then repeating the sequence with a different paste. In the invention, either the glass softening temperature or the glass content, or both, the two pastes are different such that the baking shrinking rates of the two glass containing layers are about the same.

The Narahara reference relates to forming a film by applying a photosensitive resin composition which contains a combination of first and second resins, and optionally other materials. A careful review of this reference has not revealed any instance in which a first composition is applied and baked and followed by the application and baking of a second composition, regardless of the identity of the compositions. As a result, the Narahara reference is insufficient to form a *prima facie* basis for the rejection.

Beyond the foregoing, the Examiner's comment about the scope of the scope of the term "glass" on page 3 of the Office Action has been noted. While that definition may be appropriate in the abstract, the PTO is required to give terminology the broadest reasonable interpretation consistent with the disclosure in the application as it would be understood by those of ordinary skill in the art. That reasonable

interpretation would be consistent with the definition of the term given in Grant & Hackh's Chemical Dictionary Fifth Edition, a copy of which is attached hereto. The reasonable expansive interpretation would not include the resin materials described by Narahara.

Still further, the claims in this application make reference to the glass softening temperature but no disclosure about the softening temperature has been found in the cited reference. With regard to the glass content, Narahara does not teach or suggest that the content be different in two pastes since, as noted earlier, there is no description of two pastes in this reference.

In light of the foregoing considerations, it is respectfully submitted that this application is now in condition to be allowed and the early issuance of a Notice of Allowance is respectfully solicited.

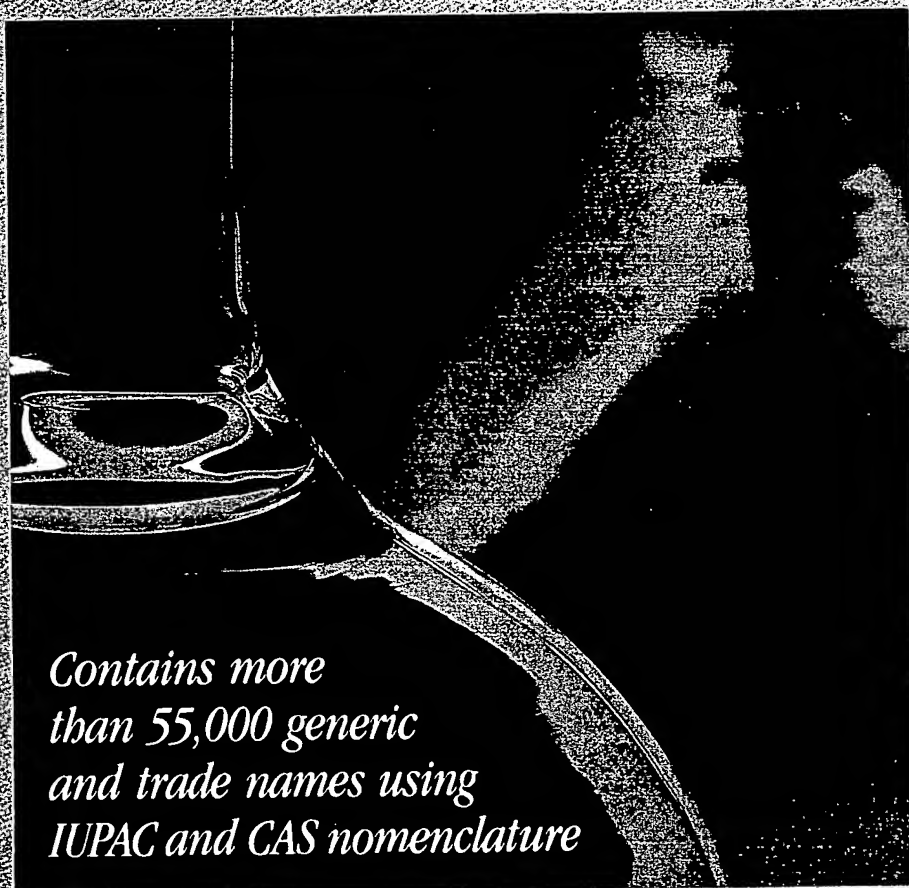
Dated: May 31, 2006

Respectfully submitted,

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$$E = H/nF + T dE/dT$$

where E is the emf of the cell, H the heat equivalent of the chemical change for molar quantities expressed in electrical units, F the Faraday constant, T the thermodynamic temperature at which the cell is working, and n the valency, or the number of charges carried by a mole of the substances undergoing change; dE/dT is the rate of change in emf with temperature of the cell. **G.**, Oliver Wolcott (1822-1908) American chemist noted for his work on complex compounds. **G. paradox** Work results when 2 gases of thermodynamically identical physical properties (e.g., N_2 and CO) are mixed, but not when 2 portions of the same gas are mixed. **G. phase rule** See *phase rule*. **gibbsite** $Al(OH)_3$. A native aluminum hydroxide. **gibrel** $C_{19}H_{21}O_6K = 384.5$. Potassium gibberellate; used to increase the microbial activity of the soil. **Giemsa, Gustav (1867-1948)** German chemotherapist. **G. stain** A staining for white blood cells and bacteria: Azur II Eosin 0.3, Azur II 0.8, glycerol 250 g; and 250 mL methanol. **G. ultrafilter** A device for sterilizing and filtering small quantities of biological liquids through a collodion membrane. **giga*** G. SI prefix for a multiple of 10^9 . **gigantolite** A pseudomorph of iolite. **Gilbert G., Sir Joseph Henry (1817-1901)** British chemist, noted for agricultural research. **G., Ludwig Wilhelm (1769-1824)** German chemist, and editor of *Annalen der Physik*. **G., Walter (1932-)** American chemist, Nobel prize winner (1980). Noted for work on chemical structure of DNA. **G. William (1540-1603)** British natural philosopher, physician to Queen Elizabeth I, and a pioneer in magnetism and electricity. **gilbert** An obsolete unit of magnetic quantity. 1 gilbert = 0.795775 A (the SI unit). **pra** ~ See *pragilbert*. **Gilead balm** Balm of Gilead, Mecca balsam. An oleoresin from *Balsamodendron gileadense* (Burseraceae). Cf. *poplar buds*. **Giles flask** A volumetric flask with long neck, graduated at x and at $(x + 10\%)x$ of its volume; used to prepare normal solutions. **gill** A liquid measure: 1 U.S. gill = 118.29 mL = 0.83267 U.K. gill. **gillenia** Indian physic, American ipecac. The root bark of *G. trifoliata* or *G. stipulacea* (Rosaceae); an emetic and cathartic. **gilpinite** Uranvitriol. **gilsonite** Uintaite. A black, brittle, lustrous hydrocarbon mineral. **gin** An alcoholic beverage made by distillation of a fermented extract of grain in the presence of juniper leaves. **artificial** ~ Fancy g. to which flavoring essences have been added. **fancy** ~ A mixture of g. and neutral alcohol. **gingelly** Sesame. **ginger** Zingiber. The dried rhizome of *Zingiber officinalis*

(Scitamineae), Asia, W. Indies, Africa; an aromatic, flavoring, and carminative (BP). **jamaica** ~ The yellow roots, with the skin removed. **wild** ~ *Asarum*. **g. oil** The essential oil of g., d.0.882-0.900, b.155-300, containing phellandrene and zingiberene. **gingerin** An oleoresin from ginger. **gingerol** An essential oil from ginger. **ginkgetin** $C_{32}H_{22}O_{10} = 566.5$. A yellow biflavonyl pigment from the leaves of *Ginkgo biloba*, maidenhair tree, m.343. **ginkgolic acid** $C_{22}H_{34}O_3 = 346.5$. (Z)-2-Hydroxy-6(8-pentadecenyl)benzoic acid*. An unsaturated acid from the fruit of *Ginkgo biloba*. **ginning** The removal of the larger seed hairs from the cotton plant. Cf. *linters*. **ginseng** *Panax*. The dried roots of *Panax quinquefolium* (Aralia); a reputed tonic that may cause hypertension. **gismondine** Gismondite. **gismondite** $CaAl_2Si_2O_{12}$. Gismondine, abazite. A gray, hydrated, monoclinic zeolite, d.2.4, hardness 5-5.5. **gitalin** $C_{28}H_{48}O_{10} = 544.7$. A glucoside, m.253, from digitalis. **githagenin** $C_{28}H_{44}O_4 = 444.4$. The aglycone of githagin. **githagin** A saponin from corn cockle, *Agrostemma githago*; hydrolyzes to githagenin and glucuronic acid. **gitogenic** (1) Having a digitalislike effect. (2) The structure of digitalis aglucones. **gitoxigenin** $C_{23}H_{34}O_5 = 390.5$. 3,14,16-Trihydroxy-20(22)-cardenolide. m.222. A split product of gitoxin. **gitoxin** A glucoside from the leaves of digitalis; it hydrolyzes to 1 mole gitoxigenin and 3 moles digitoxose. **glacial** Describing a compound of icelike, crystalline appearance, especially the solid form of a liquid compound; as, glacial acetic acid. **gladiolic acid** $C_{11}H_{10}O_5 = 222.2$. 2,3-Diformyl-6-methoxy-5-methylbenzoic acid*. From *Penicillium gladioli*. Silky needles, m.160; an antibiotic. With ammonia it gives a deep green color, changing after 12 hours to red and then orange. **glair** Prepared white of egg used for tempera painting. **glance** General term for minerals with a glassy luster, e.g., lead glance. **gland** An organ or group of cells that secretes specific substances, e.g., enzymes, sweat, mucus. **Glanzstoff** Trademark for a viscose synthetic fiber. Cf. *rayon*. **Glaser furnace** A combustion furnace used for organic elementary analysis. **glaserite** $Na_2SO_4 \cdot 3K_2SO_4$. Aphthitalite, arcanite. A colorless, vitreous sulfate, d.2.6, hardness 3-3.5 (Stassfurt). **glass** An amorphous, hard, brittle, often transparent material; a fused mixture of the silicates of the alkali and alkaline-earth or heavy metals. See Table 39. Composition: between $(K,Na)_2O$, $(Ca,Pb)O$, $6SiO_2$ and $5(K,Na)_2O$, $7(Ca,Pb)O$, $36SiO_2$.

TABLE 39. TYPICAL GLASS COMPOSITIONS, %

Composition	Soda, window	Flint	Bottle	Borosilicate	Lead	Aluminosilicate	Silica
(A) SiO_2	71.5	54	74	80.5	35.0	58.7	96.3
Al_2O_3	1.5	—	0.5	2.4	—	22.4	0.4
B_2O_3	—	—	—	12.9	—	3.0	2.9
(B) Na_2O	14.0	—	17	3.8	—	} 1.4	} 0.4
K_2O	—	10	—	—	7.0		
(C) CaO	13.0	—	5	0.4	—	6.0	—
PbO	—	36	—	—	58.0	—	—
MgO	—	—	3.5	—	—	8.5	—

Formula: $(K,Na)O-Si_nO_{2n-1}O(Ca,Pb)O-Si_nO_{2n-1}-O(K,Na)$.

Classification:

1. Potash-lime g.: hard, resistant to water and acids, d.2.4; used for chemical glassware.
 2. Soda-lime g.: more fusible and less resistant than potash-lime g., d.2.65; used for windows.
 3. Potash-lead g.: readily fusible and highly refractive; as, crystal g., d.2.9-3.6; flint g., d.3.3-3.6; paste for artificial gems and lenses; crown g. (containing barium oxide), d.1.5-1.56.
 4. Bottle g. (Na, K, Ca, and Al silicates), d.2.73.
 5. Opaque g.: opacified by barite, smalts, or bone ash.
 6. Colored g.:
 - (a) Yellow: antimony, iron, silver, uranium.
 - (b) Red: gold chloride, ochre, cuprous oxide, selenium.
 - (c) Green: ferrous sulfate, copper, chromium oxide.
 - (d) Blue: cobalt oxide, traces of copper.
 - (e) Iridescent: the action of vapors of metallic chlorides on the hot g.
 - (f) Nacreous: Addition of scales of mica.
- bio ~ See *bioglass*. blown ~ A g. that is blown into shape. bohemian ~ Potash g. borax ~ A g. with a low expansion coefficient, which contains borax. borosilicate ~ A heat-resistant silicate g. containing at least 5% boric acid, d.2.25, m.730. Cf. *Pyrex*. bottle ~ A g. that is blown into shape in a mold. bulletproof ~ Plate g. sheets cemented together by a transparent medium. canary ~ Uranium g. cast ~ Plate g. chemical ~ An acid g. or alkali-resistant g. for chemical apparatus. chromium ~ A g. colored yellow by chromium compounds. clock ~ G. similar in shape to that used for covering clock faces; used to cover beakers, etc. cobalt ~ A g. colored purple-blue by cobalt compounds; a light filter. conductive ~ G. rendered electrically conductive to a desired extent by treatment with tin chloride and heating to produce a layer of tin oxide. copper ~ G. colored blue or red by copper compounds. cover ~ A thin g. square used to cover microscope specimens on the slide. crown ~ A hard optical g. silicate of sodium with calcium and aluminum oxides; formerly made by blowing and spinning, to form a disk, from which small windowpanes were cut. cryolite ~ Milk g. crystal ~ Flint g. electric bulb ~ A lime g. used for electric bulbs. fiber ~ G. fiber. flint ~ A soft optical g. made from sand, potash, and lead oxide. float ~ G. solidified as a continuous sheet on a bath of molten metal (as, tin) at 1000°C. It has a high surface finish, flatness, and absence of distortion. frosted ~ Opaque g. having a roughened surface. iron ~ G. colored yellow, olive green, or pale blue by iron compounds. Jena ~ Optical and heat-resisting g. made at Jena. laminated ~ Safety g. made by cementing thin sheets of g. together with a plastic at 90-130°C and 1.7-2.4 MPa. It may crack but will not splinter under impact. lead ~ A soft g. with a low melting point, containing lead oxide; e.g., flint g. lime ~ G. containing calcium oxide; e.g., venetian g. manganese ~ G. colored violet by manganese compounds. milk ~ G. colored milky white by cryolite. Muscovy ~ Muscovite. normal ~ A g. of definite chemical composition. opal ~ G. colored milky white by calcium phosphate or bone ash. optical ~ See *crown glass*, *flint glass* (both above). organic ~ Synthetic g. Synthetic resins having the appearance of g., e.g., Perspex. plate ~ A thick g. made by pouring molten g. on iron tables, then rolling and polishing it; used for mirrors and windows. porous ~ G. containing pores of molecular dimensions, made by leaching boric acid from heat-treated borosilicate g.

(SiO₂ 96, void space 25%). Used in filters and salt bridges. potash ~ Bohemian g. G. containing more potassium than sodium, e.g. crown g. rolled ~ Inferior plate g., made by passing molten g. between iron rolls. ruby ~ Dark-red g. containing copper compounds or colloidal gold. safety ~ Laminated g. sheet ~ Flat sheets made by blowing long cylinders, splitting them longitudinally, and flattening them out. silica ~ Though not a true g., fused silica is often used for a transparent, resistant g. silicate-flint ~ A Jena g.: SiO₂ 29-53, PbO 67-36, K₂O 3-8, Na₂O 0-1, Mn₂O₃ 0.04-0.06, As₂O₃ 0.2-0.3%; used for optical purposes. soda ~ G. containing more sodium than potassium; e.g., venetian g. sol-gel process ~ G. produced by a new method involving the collapse of a microporous structure at temperatures well below the 800-950°C used traditionally. soluble ~ Water g. spun ~ G. fiber. synthetic ~ Organic g. thallium ~ G. containing Tl in place of Pb. toughened ~ Heat-treated plate g. used to prevent splintering under impact. Cf. *laminated glass*. uranium ~ A dichroic, greenish-yellow glass containing uranium compounds, used for light filters. watch ~ A small clock glass, q.v. water ~ Sodium or potassium silicate. window ~ G. plates made by blowing the molten g. into cylinders, then slitting and flattening them out on tables. zinc-crown ~ An optical g.: SiO₂ 65.4, K₂O 15, Na₂O 5, BaO 9.6, ZnO 2.0, As₂O₃ 0.4, Mn₂O₃ 0.1, B₂O₃ 2.5%.

g. beads Solid or hollow spheres; used to prevent excessive ebullition of heated liquids or to determine the specific gravity of liquids. g. colors See *glass* (6). g. cullet (1) Broken g. waste. (2) Powdered waste from g. manufacture; used as abrasive in matches, primers, polishes, soaps, and cements. g. cutters Small, mounted diamond fragments, used to cut glass. g. drops Prince Rupert drops. g. fiber Fiberglass. Glass in filaments, of 3 types: (1) For reinforcing plastics, as GRP (see below). Has low alkali content. (2) For reinforcing cement. An alkali-lime-silica-zirconia mixture. (3) For insulation. Similar to flat glass, but with some silica replaced by ulexite or rasorite. g. fiber-reinforced plastics GRP. Materials giving good corrosion resistance, high strength-to-weight ratio, high thermal and electrical insulation; suitable for fabricating in complex shapes. g. gage A metal disk with round holes, used to measure the outside diameter of g. tubing. g. marking Ceramic ink. g. of antimony The fused mass resulting from the incomplete oxidation of antimony glance. g. paper Calico or paper covered with thin glue and sprinkled with powdered g.; used for polishing. g. tubing A hollow g. rod, used in scientific apparatus. barometer ~ Capillary g. t. capillary ~ A thick-walled g. tube having a bore of less than 1 mm. g. tank The container lined with aluminum silicate in which g. is melted. g. wool Glass fiber.

glassine A thin, hard, and almost transparent paper made from well-beaten chemical wood pulp.

Glauber, Johann Rudolf (1603-1668) Dutch iatrochemist who prepared many metallic salts. g. salt Crystalline sodium sulfate decahydrate.

glauberite CaSO₄·Na₂SO₄. A calcium sodium sulfate (Stassfurt).

glaucine C₂₁H₂₅O₅N = 371.4. An alkaloid from the sap of *Glaucium flavum*, yellow horned poppy (Papaveraceae). Yellow prisms, m.119.

glauchochroite CaMnSiO₄. A rare silicate of the olivine group.

glaucodot (Fe,Co)S₂·(Fe,Co)As₂. A native sulfarsenide. Cf. *allocklasite*.

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